

NATIONAL QUALITY FORUM—Evidence (subcriterion 1a)

Measure Number (if previously endorsed): 0280

Measure Title: Dehydration Admission Rate (PQI 10)

IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here: [Click here to enter composite measure #/ title](#)

Date of Submission: [Click here to enter a date](#)

Instructions

- **For composite performance measures:**
 - A separate evidence form is required for each component measure unless several components were studied together.
 - If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.
- Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of supplemental materials may be submitted, but there is no guarantee it will be reviewed.
- If you are unable to check a box, please highlight or shade the box for your response.
- Maximum of 10 pages (includes questions/instructions; minimum font size 11 pt; do not change margins). **Contact NQF staff if more pages are needed.**
- Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](#).

Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF's evaluation criteria.

1a. Evidence to Support the Measure Focus

The measure focus is evidence-based, demonstrated as follows:

- **Health outcome:** ³ a rationale supports the relationship of the health outcome to processes or structures of care. Applies to patient-reported outcomes (PRO), including health-related quality of life/functional status, symptom/symptom burden, experience with care, health-related behavior.
- **Intermediate clinical outcome:** a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence ⁴ that the measured intermediate clinical outcome leads to a desired health outcome.
- **Process:** ⁵ a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence ⁴ that the measured process leads to a desired health outcome.
- **Structure:** a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence ⁴ that the measured structure leads to a desired health outcome.
- **Efficiency:** ⁶ evidence not required for the resource use component.

Notes

3. Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.
4. The preferred systems for grading the evidence are the U.S. Preventive Services Task Force (USPSTF) [grading definitions](#) and [methods](#), or Grading of Recommendations, Assessment, Development and Evaluation ([GRADE](#)) [guidelines](#).
5. Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement. Note: A measure focused only on collecting PROM data is not a PRO-PM.
6. Measures of efficiency combine the concepts of resource use and quality (see NQF's [Measurement Framework: Evaluating Efficiency Across Episodes of Care](#); [AQA Principles of Efficiency Measures](#)).

1a.1. This is a measure of: *(should be consistent with type of measure entered in De.1)*

Outcome

- ☒ Health outcome: Click here to name the health outcome
- ☐ Patient-reported outcome (PRO): Click here to name the PRO
PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors
- ☐ Intermediate clinical outcome (e.g., lab value): Click here to name the intermediate outcome
- ☐ Process: Click here to name the process
- ☐ Structure: Click here to name the structure
- ☐ Other: Click here to name what is being measured

HEALTH OUTCOME/PRO PERFORMANCE MEASURE *If not a health outcome or PRO, skip to [1a.3](#)*

1a.2. Briefly state or diagram the path between the health outcome (or PRO) and the healthcare structures, processes, interventions, or services that influence it.

Dehydration is a serious acute condition that occurs mostly in elderly patients and patients with other underlying illnesses. Dehydration for the most part can be treated in the outpatient setting. Dehydration is preventable through attention and support for fluid intake, especially in patients at risk. Those at risk includes but not limited to with cognitive or psychiatric disorders, increased age, with co-morbid illness requiring medications such as diuretics or laxatives, polypharmacy, diabetes, acute gastroenteritis, and those living in areas with extreme heat. Dehydration is treatable with oral rehydration therapy and/or intravenous (IV) fluids and by addressing the underlying cause. If left untreated, serious complications including acute kidney injury and mortality are possible. Community interventions include air conditioning for the elderly during intense heat waves.

1a.2.1. State the rationale supporting the relationship between the health outcome (or PRO) to at least one healthcare structure, process, intervention, or service (i.e., influence on outcome/PRO).

Dehydration can be prevented by increased surveillance of patients at risk in the outpatient setting along with early intervention. Patients with poor access to primary care providers may seek treatment later and may be more likely to seek emergency care.

Note: For health outcome/PRO performance measures, no further information is required; however, you may provide evidence for any of the structures, processes, interventions, or service identified above.

INTERMEDIATE OUTCOME, PROCESS, OR STRUCTURE PERFORMANCE MEASURE

1a.3. Briefly state or diagram the path between structure, process, intermediate outcome, and health outcomes. Include all the steps between the measure focus and the health outcome.

1a.3.1. What is the source of the systematic review of the body of evidence that supports the performance measure?

- ☐ Clinical Practice Guideline recommendation – **complete sections [1a.4](#), and [1a.7](#)**
- ☐ US Preventive Services Task Force Recommendation – **complete sections [1a.5](#) and [1a.7](#)**
- ☐ Other systematic review and grading of the body of evidence (e.g., Cochrane Collaboration, AHRQ Evidence Practice Center) – **complete sections [1a.6](#) and [1a.7](#)**
- ☐ Other – **complete section [1a.8](#)**

Please complete the sections indicated above for the source of evidence. You may skip the sections that do not apply.

1a.4. CLINICAL PRACTICE GUIDELINE RECOMMENDATION

1a.4.1. Guideline citation (including date) and URL for guideline (if available online):

Guidelines suggest that prevention of dehydration, and therefore hospitalizations for dehydration, are possible.

NGC:009717 Menten JC. Managing oral hydration. In: Boltz M, Capezuti E, Fulmer T, Zwicker D, editor(s). Evidence-based geriatric nursing protocols for best practice. 4th ed. New York (NY): Springer Publishing Company; 2012. p. 419-38. (more detail in 1a.4.2)

Additional guidelines:

NGC:008652 Menten JC, Kang S. Hydration management. Iowa City (IA): University of Iowa College of Nursing, John A. Hartford Foundation Center of Geriatric Nursing Excellence; 2011 Apr. 43 p. [136 references]

NGC:007636 American Medical Directors Association (AMDA). Dehydration and fluid maintenance in the long-term care setting. Columbia (MD): American Medical Directors Association (AMDA); 2009. 29 p. [60 references]

1a.4.2. Identify guideline recommendation number and/or page number and quote verbatim, the specific guideline recommendation.

Levels of evidence (**I–VI**) are defined at the end of the "Major Recommendations" field.

Parameters of Assessment (Menten & Iowa-Veterans Affairs Nursing Research Consortium [IVANRC], 2000 [**Level I**])

Health history

- Specific disease states: dementia, congestive heart failure, chronic renal disease, malnutrition, and psychiatric disorders such as depression (Albert et al., 1989 [**Level III**]; Gaspar, 1988 [**Level IV**]; Warren et al., 1994 [**Level IV**])
- Presence of comorbidities: more than four chronic health conditions (Lavizzo-Mourey, Johnson, & Stolley, 1988 [**Level IV**])
- Prescription drugs: number and types (Lavizzo-Mourey, Johnson, & Stolley, 1988 [**Level IV**])
- Past history of dehydration, repeated infections (Menten, 2006 [**Level IV**])

Physical assessments (Menten & IVANRC, 2000 [**Level I**])

- Vital signs
- Height and weight
- Body mass index (BMI) (Vivanti et al., 2008 [**Level IV**])
- Review of systems
- Indicators of hydration

Laboratory tests

- Urine-specific gravity (Menten, 2006 [**Level IV**]; Wakefield et al., 2002 [**Level IV**])
- Urine color (Menten, 2006 [**Level IV**]; Wakefield et al., 2002 [**Level IV**])
- Blood urea nitrogen (BUN)/creatinine ratio
- Serum sodium
- Serum osmolality
- Salivary osmolality
- Individual fluid intake behaviors (Menten, 2006 [**Level IV**])

Nursing Care Strategies

Risk Identification (Mentes & IVANRC, 2000 [Level I])

- Identify acute situations: vomiting, diarrhea, or febrile episodes
- Use a tool to evaluate risk: Dehydration Risk Appraisal Checklist

Acute Hydration Management

- Monitor input and output (Weinberg et al., 1994 [Level I]).
- Provide additional fluids as tolerated (Weinberg et al., 1994 [Level I]).
- Minimize fasting times for diagnostic and surgical procedures (American Society of Anesthesiologists, 1999 [Level I]).

Ongoing Hydration Management

- Calculate a daily fluid goal (Mentes & IVANRC, 2000 [Level I]).
- Compare current intake to fluid goal (Mentes & IVANRC, 2000 [Level I]).
- Provide fluids consistently throughout the day (Ferry, 2005 [Level VI]; Simmons, Alessi, & Schnelle, 2001 [Level II]).
- Plan for at-risk individuals
- Fluid rounds (Robinson & Rosher, 2002 [Level IV]).
- Provide two 8-oz. glasses of fluid, one in the morning and the other in the evening (Robinson & Rosher, 2002 [Level IV]).
- "Happy hours" to promote increased intake (Musson et al., 1990 [Level V]).
- "Tea time" to increase fluid intake (Mueller & Boisen, 1989 [Level V]).
- Offer a variety of fluids throughout the day (Simmons, Alessi, & Schnelle, 2001 [Level II]).
- Fluid regulation and documentation
- Teach able individuals to use a urine color chart to monitor hydration status (Armstrong et al., 1994 [Level IV]; Armstrong et al., 1998 [Level IV]; Mentes, 2006 [Level IV]).
- Document a complete intake recording including hydration habits (Mentes & IVANRC, 2000 [Level I]).
- Know volumes of fluid containers to accurately calculate fluid consumption (Burns, 1992 [Level IV]; Hart & Adamek, 1984 [Level III]).

Follow-up Monitoring of Condition

- Urine color chart monitoring in patients with better renal function (Armstrong et al., 1994 [Level IV]; Armstrong et al., 1998 [Level IV]; Wakefield et al., 2002 [Level IV]).
- Urine specific-gravity checks (Armstrong et al., 1994 [Level IV]; Armstrong et al., 1998 [Level IV]; Wakefield et al., 2002 [Level IV]).
- 24-hour intake recording (Metheny, 2000 [Level VI]).

1a.4.3. Grade assigned to the quoted recommendation with definition of the grade:

Levels of Evidence

Level I: Systematic reviews (integrative/meta-analyses/clinical practice guidelines based on systematic reviews)

Level II: Single experimental study (randomized controlled trials [RCTs])

Level III: Quasi-experimental studies

Level IV: Non-experimental studies

Level V: Care report/program evaluation/narrative literature reviews

Level VI: Opinions of respected authorities/consensus panels

AGREE Next Steps Consortium (2009). Appraisal of guidelines for research & evaluation II. Retrieved from <http://www.agreetrust.org/?o=1397> .

Adapted from: Melnyck, B. M. & Fineout-Overholt, E. (2005). Evidence-based practice in nursing & health care: A guide to best practice. Philadelphia, PA: Lippincott Williams & Wilkins and Stetler, C.B., Morsi, D., Rucki, S., Broughton, S., Corrigan, B., Fitzgerald, J., et al. (1998). Utilization-focused integrative reviews in a nursing service. Applied Nursing Research, 11(4) 195-206.

1a.4.4. Provide all other grades and associated definitions for recommendations in the grading system. (Note: If separate grades for the strength of the evidence, report them in section 1a.7.)

1a.4.5. Citation and URL for methodology for grading recommendations (if different from 1a.4.1):

1a.4.6. If guideline is evidence-based (rather than expert opinion), are the details of the quantity, quality, and consistency of the body of evidence available (e.g., evidence tables)?

☐ Yes → **complete section 1a.7**

☐ No → **report on another systematic review of the evidence in sections 1a.6 and 1a.7; if another review does not exist, provide what is known from the guideline review of evidence in 1a.7**

1a.5. UNITED STATES PREVENTIVE SERVICES TASK FORCE RECOMMENDATION

1a.5.1. Recommendation citation (including date) and **URL** (if available online):

1a.5.2. Identify recommendation number and/or page number and quote verbatim, the specific recommendation.

1a.5.3. Grade assigned to the quoted recommendation with definition of the grade:

1a.5.4. Provide all other grades and associated definitions for recommendations in the grading system. (Note: the grading system for the evidence should be reported in section 1a.7.)

1a.5.5. Citation and URL for methodology for grading recommendations (if different from 1a.5.1):

Complete section 1a.7

1a.6. OTHER SYSTEMATIC REVIEW OF THE BODY OF EVIDENCE

1a.6.1. Citation (including date) and **URL** (if available online):

1a.6.2. Citation and URL for methodology for evidence review and grading (if different from 1a.6.1):

Complete section 1a.7

1a.7. FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE SUPPORTING THE MEASURE

If more than one systematic review of the evidence is identified above, you may choose to summarize the one (or more) for which the best information is available to provide a summary of the quantity, quality, and consistency of the body of evidence. Be sure to identify which review is the basis of the responses in this section and if more than one, provide a separate response for each review.

1a.7.1. What was the specific structure, treatment, intervention, service, or intermediate outcome addressed in the evidence review?

1a.7.2. Grade assigned for the quality of the quoted evidence with definition of the grade:

1a.7.3. Provide all other grades and associated definitions for strength of the evidence in the grading system.

1a.7.4. What is the time period covered by the body of evidence? (*provide the date range, e.g., 1990-2010*). Date range: [Click here to enter date range](#)

QUANTITY AND QUALITY OF BODY OF EVIDENCE

1a.7.5. How many and what type of study designs are included in the body of evidence? (*e.g., 3 randomized controlled trials and 1 observational study*)

1a.7.6. What is the overall quality of evidence across studies in the body of evidence? (*discuss the certainty or confidence in the estimates of effect particularly in relation to study factors such as design flaws, imprecision due to small numbers, indirectness of studies to the measure focus or target population*)

ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE

1a.7.7. What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence? (*e.g., ranges of percentages or odds ratios for improvement/decline across studies, results of meta-analysis, and statistical significance*)

1a.7.8. What harms were studied and how do they affect the net benefit (benefits over harms)?

UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE

1a.7.9. If new studies have been conducted since the systematic review of the body of evidence, provide for each new study: 1) citation, 2) description, 3) results, 4) impact on conclusions of systematic review.

1a.8 OTHER SOURCE OF EVIDENCE

If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.

1a.8.1 What process was used to identify the evidence?

[Formal environmental scans of the literature, including routine Pub-Med searches.](#)

1a.8.2. Provide the citation and summary for each piece of evidence.

[Evidence of Impact](#)

Dehydration is a serious acute condition that occurs mostly in elderly patients and patients with other underlying illnesses, following insufficient attention and support for fluid intake. It is treatable with oral rehydration therapy and/or intravenous (IV) fluids. If left untreated in older adults, serious complications including mortality are possible. In a study of Medicare hospital admissions in 1991, almost 7 percent of all admissions had dehydration as one of five diagnoses and almost 2 percent of all hospitalizations had dehydration as the primary diagnosis. Of these patients with a primary diagnosis of dehydration, 18 percent within 30 days and almost 50 percent died within a year (1). An admission rate of 7.3 percent of total admissions for dehydration suggests that dehydration is sufficiently common, and thus this indicator can reasonably be measured with adequate precision (2).

Clinical Evidence

Dehydration is a somewhat common cause of hospital admission. One study noted that dehydration accounted for 7.3 percent of total admissions for ACSCs (3).

Dehydration occurs mostly in elderly patients and patients with other underlying illnesses, following insufficient attention and support for fluid intake. It is treatable with oral rehydration therapy and/or intravenous (IV) fluids. If left untreated in older adults, serious complications including mortality are possible. In a study of Medicare hospital admissions in 1991, almost seven percent of all admissions had dehydration as one of five diagnoses and almost two percent of all hospitalizations had dehydration as the primary diagnosis. Of these patients with a primary diagnosis of dehydration, 18 percent died within 30 days and almost 50 percent died within a year (4).

References:

1. Stevens-Simon C, Orleans M. Low-birthweight prevention programs: the enigma of failure. *Birth* 1999;26:184-191.
2. Kruzikas DT JIRDBMCRAR. Preventable Hospitalizations: A Window into Primary and Preventive Care, 2000. Agency for Healthcare Research and Quality HCUP Factbook No. 5. AHRQ Publication No. 04-0056. 9-1-2004. Rockville, MD. 2000.
3. Blustein J, Hanson K, Shea S. Preventable hospitalizations and socioeconomic status. *Health Aff (Millwood)* 1998;17:177-189.
4. Warren JL, Bacon WE, Harris T, McBean AM, Foley DJ, Phillips C. The burden and outcomes associated with dehydration among US elderly, 1991. *Am J Public Health* 1994;84:1265-1269.